



## INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

# Ethanol

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**Description:**

- Ethanol is an alcohol-based alternative fuel which is commonly made from standard crops such as corn.
- As a result of advancing science, ethanol may soon be economically manufactured from previously unused resources like agricultural residue and forestry waste materials.
- Originally a 10% ethanol blend was used in order to meet vapor content limits and oxygenate requirements in areas with regulated fuel programs; now most U.S. gasoline is blended with 10% ethanol as a cost-effective and more environmentally-friendly replacement for methyl tertiary butyl ether (MTBE).
- E85 is a fuel blend for use in specially designed “flex-fuel” vehicles that blends 85% ethanol and 15% gasoline.
- Indiana has numerous ethanol plants operating with approved permits from the Indiana Department of Environmental Management (IDEM), growing a new sector of the economy and providing outlets for Indiana’s agricultural products.

**Environmental Impacts:**

- The effect of burning ethanol as a fuel product is a net decline in criteria pollutant emissions from vehicles, a reduction of our dependence on foreign oil, and a utilization of a renewable Indiana resource.
- Ethanol does not contain the same harmful carcinogens and toxins found in gasoline; it is water-soluble and biodegradable.
- Using ethanol and other biofuels instead of petroleum products can reduce hydrocarbons emissions, particulate matter emissions and carbon monoxide emissions.
- Ethanol and bioenergy production can provide a partial solution to waste management by converting waste products, such as livestock waste and wood waste, into sources of energy, reducing effects of waste on our communities.

**IDEM’s Role:**

- IDEM is responsible for protecting human health and the environment while providing for safe industrial, agricultural, commercial and governmental operation vital to a prosperous economy.
- IDEM regulates ethanol production facilities during construction and operation through clear and consistent permitting procedures pursuant to federal and state environmental regulations through our separate offices:

**Office of Air Quality**

- All ethanol production facilities must receive air construction and operating permits requiring monitoring and limits on air emissions from IDEM’s Office of Air Quality to ensure that they do not endanger the health of the surrounding community or degrade local air quality.
- Title V Operating Permits incorporate all the applicable requirements that regulate the amount and type of emissions allowed into the air by the ethanol plants.

- The limits are set using health-based standards for the emissions of all criteria pollutants (oxides of nitrogen [NO<sub>x</sub>], sulfur dioxides [SO<sub>2</sub>], particulate matter [PM/PM<sub>10</sub>/PM<sub>2.5</sub>], volatile organic compounds [VOC], and carbon monoxide [CO]). The limits for hazardous air pollutants [HAP] emissions are set using technology-based standards. Testing is required to verify that these limits are being met.
- The Indiana Administrative Code (326 IAC 8-5-6) requires dry mill ethanol production facilities modified or constructed after April 1, 2007 to install one of three devices aimed at reducing VOC emissions with an efficiency of at least 98%.

#### Office of Water Quality

- Ethanol production facilities receive permits from IDEM's Office of Water Quality to limit effects of discharges to local bodies of water.
- National Pollutant Discharge Elimination System (NPDES) storm water permits regulate the way construction activities and industrial materials are exposed to storm water runoff, requiring ethanol production facilities to develop and implement a Storm Water Pollution Prevention Plan.
- If an ethanol plant discharges wastewater, then it is subject to an NPDES wastewater permit, which establishes protective limits for water quality and includes the testing and reporting of all wastewater discharged.
- If the ethanol plant provides water for human consumption, a Public Water Supply permit (for drinking water) is required.
- If the plant intends to disturb a public waterway or wetland during construction activities or operation, additional permits may apply, including a Clean Water Act Section 401 Water Quality Certification and Section 404 permit, issued by the Army Corps of Engineers.

#### Office of Land Quality

- If an ethanol production facility intends to process, handle, store or generate solid or hazardous waste, it may also be required to receive permits from IDEM's Office of Land Quality to ensure that it complies with applicable federal and state solid and hazardous waste regulations.

#### **More Information:**

- Land use, siting and zoning decisions are the responsibility of local government. This includes addressing quality of life issues.
- Environmental requirements are established by the Environmental Rules Board and implemented by IDEM. For more information on the Environmental Rules Board visit our website at <http://www.in.gov/idem/6820.htm>.
- State requirements are based upon federal requirements and protect both human health and the environment.
  - For more information on NPDES permits visit our website at: [www.idem.IN.gov/4894.htm](http://www.idem.IN.gov/4894.htm).
  - For more information on air permits visit our website at: [www.idem.IN.gov/airquality/2356.htm](http://www.idem.IN.gov/airquality/2356.htm).
  - For more information on solid and hazardous waste permits visit our website at: [www.idem.IN.gov/4222.htm](http://www.idem.IN.gov/4222.htm).
  - For more information on ethanol and Indiana agriculture, visit the State Department of Agriculture's website at: [www.IN.gov/isda/biofuels/ethanol.html](http://www.IN.gov/isda/biofuels/ethanol.html).
  - For more information on E85 including its benefits as an energy source and locations of E85 pumps in Indiana, visit the Office of Energy and Defense Development Web site at: [www.IN.gov/oed/2673.htm](http://www.IN.gov/oed/2673.htm).